

## **Appendix G**

### **Energy Effects of Critical Habitat Designation**

This appendix considers the impacts of critical habitat designation for the seven Pacific salmon and O. mykiss ESUs in California on the supply, distribution, or use of energy. On May 18, 2001, Executive Order No. 13211, "Actions Concerning Regulations That Significantly Affect Energy Supply, Distribution, or Use," was issued. This order directs Federal agencies to "weigh and consider the effects of the Federal Government's regulations on the supply, distribution, and use of energy." It also directs those agencies to prepare and submit to OMB's Office of Information and Regulatory Affairs (OIRA) a "Statement of Energy Effects" for their "significant energy actions."

According to the order, a "significant energy action" is one that "is a significant regulatory action under Executive Order 12866 or any successor order, and is likely to have a significant adverse effect on the supply, distribution, or use of energy ..." OMB guidance suggests the following thresholds for determining whether an action has a "significant adverse effect" (OMB 2001).

Adverse effects could include any of the following outcomes compared to a world without the regulatory action under consideration:

1. Reductions in crude oil supply in excess of 10,000 barrels per day;
2. Reductions in fuel production in excess of 4,000 barrels per day;
3. Reductions in coal production in excess of 5 million tons per year;
4. Reductions in natural gas production in excess of 25 million mcf (thousand cubic feet) per year;
5. Reductions in electricity production in excess of 1 billion kilowatt-hours per year or in excess of 500 megawatts of installed capacity;
6. Increases in energy use required by the regulatory action that exceed any of the thresholds above;
7. Increases in the cost of energy production in excess of one percent;
8. Increases in the cost of energy distribution in excess of one percent; or
9. Other similarly adverse outcomes.

For the purposes of critical habitat designation and its effects on energy, this analysis focuses on the fifth and seventh thresholds. This appendix includes an analysis of the co-extensive impacts of section 7 implementation even though this Executive Order falls outside the scope of the New

Mexico Cattle Growers' Association v. U.S. Fish and Wildlife Service decision. This provides a consistent context throughout the report in which to gauge the relative impacts of section 7 on the different types of activities, including energy (specifically, hydropower). The determination called for under E.O. 13211, however, involves a comparison of the energy effects of critical habitat designation to the relevant thresholds cited above. This comparison necessarily uses *incremental* impacts, not co-extensive impacts.

Available data do not allow for a precise separation of the incremental impacts of critical habitat designation. Nevertheless, as discussed later in this appendix, there is strong evidence to suggest that the incremental impacts are highly likely to be a small percentage of the total co-extensive impacts as quantified in the body of this report.

## **G 1. Hydropower Projects in the California**

Nationwide, eight to 12 percent of electricity is generated through hydropower. All of the hydropower projects in California combined have a total installed capacity of 14,116 MW, which equates to about 25 percent of California's total electricity production.<sup>1</sup> Within the State, however, hydropower provides approximately 15 percent of the total electricity produced.<sup>2</sup> This is small relative to the Pacific Northwest, where hydropower generates up to 70 percent of the total electricity; sixty percent of this hydroelectric power is generated through the Federal Columbia River Power System (FCRPS).<sup>3</sup> Because hydropower is a significantly more pervasive power source in the Pacific Northwest, environmental policies affecting water systems, such as the proposed designation of critical habitat for the salmon and O. mykiss, is likely to result in more significant impacts to the energy industry in the Pacific Northwest than in California. In the past in California, the hydropower that was produced was relied upon to provide power for critical peak demand periods. This has been less true in recent years due to increased power generation from combustion turbine peakers and advances in energy efficiency.<sup>4</sup>

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<sup>1</sup> California Energy Commission. California Hydropower System: Energy and Environment, Appendix D: 2003 Environmental Performance Report. August 2003.

<sup>2</sup> California Hydropower Reform Coalition. "Restoring the Balance: Hydropower and California's Rivers." Presented at California Energy Commission IEPR Workshop in Sacramento, California. June 5, 2003.

<sup>3</sup> National Hydropower Association. "Facts You Should Know about Hydropower." Accessed at <http://www.hydro.org/hydrofacts/facts.asp>.

<sup>4</sup> California Energy Commission. California Hydropower System: Energy and Environment, Appendix D: 2003 Environmental Performance Report. August 2003.

Approximately 90 hydropower projects exist within the area covered by the potential critical habitat designations in California. The projects range from very small projects with installed capacities considerably less than 5 MW, to larger projects such as Rock Creek (196 MW installed capacity). Within California, the majority of hydropower projects are private or State-owned and licensed by the Federal Energy Regulatory Commission (FERC). A small percentage are owned and operated by the Army Corps of Engineers (USACE) or Bureau of Reclamation (USBR).

The majority of California's hydropower projects subject to FERC relicensing were licensed 30 or more years ago and therefore were not subject to current environmental standards, including those currently in place for the salmon according to section 7 of the ESA.<sup>5</sup>

## **G 2. Hydropower dams and Section 7 Implementation**

Consultations regarding hydropower projects represent a relatively low percentage of total salmon section 7 consultation efforts. Costs of modification to hydropower projects, however, may be higher than for other activities. According to this analysis, costs of modifications to hydropower projects in consideration of the salmon in California are anticipated to be approximately 23 percent of the annual costs of overall section 7 implementation statewide. The primary modifications resulting from section 7 implementation include construction or improvements to fish passage facilities and programs, research and monitoring of water quality and fish passage efficiency, and offsite mitigation, such as land purchases for the purpose of conservation, and changes to the flow regime (either level or timing of flow). Data are not available to account for every modification to every one of the hydropower projects located in the area being considered for the critical habitat designations, particularly for modifications that may be required at some point in the future.

While some project modifications may result in lost hydropower generation, not all of these modifications have a direct link to energy production. Recommended project modifications may include programmatic changes, such as land acquisition and hatchery programs, or research and evaluation efforts. These and other modifications not directly related to energy production, however, may still be considered "costs of energy production," as they are a component of the "license" to generate energy.

## **G 3. Energy Effects and Critical Habitat Designation**

As mentioned previously, while the impacts of section 7 implementation and other conservation measures on energy production may be significant, co-extensive impacts are not a proper measure for the threshold tests required under E.O.13211. Incremental impacts – that is, the impacts of critical habitat designation that are attributable *solely* to that regulation – are the proper measurement of impacts to consider energy effects of the designation. While the available data do not support a separation of incremental impacts from co-extensive impacts, evidence suggests that the incremental impacts of critical habitat designation are small relative to the total impacts of section 7 implementation. The following discussion provides context to consider the magnitude of the total

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<sup>5</sup> Ibid.

impacts relative to the relevant thresholds under E.O. 13211. This section then contemplates whether the incremental impacts of critical habitat designation exceed the relevant energy impact thresholds.

Two threshold tests are considered to determine whether critical habitat designation will have a "significant adverse effect on the supply, distribution, or use of energy":

5. Reductions in electricity production in excess of 1 billion kilowatt-hours per year or in excess of 500 megawatts of installed capacity; and
7. Increases in the cost of energy production in excess of one percent.

Regarding the fifth threshold, there have been few instances in which section 7 implementation has resulted in a reduction in installed capacity.<sup>6</sup> The more relevant part of this threshold is the reduction in electricity production. Changes in the flow regime at a hydropower project may affect the production of energy.

For their 2003 status report, the California Energy Commission reviewed 14 recent hydropower relicensing projects to determine the effect of implementing mitigation measures, including those considering the salmon. The 14 projects had a combined installed capacity of 567 MW, and implementation of environmental mitigation measures resulted in a total decrease in energy production of approximately five percent (147 gigawatt-hours (GWh)). This reduction constitutes 0.4 percent of California's total annual hydropower production. The Commission also reviewed proposals to decommission three California hydropower projects (Battle Creek, Trinity River, and Klamath) geared at restoring salmon populations and determined that the decommissioning of the projects would result in a power production loss of 1,041 GWh, or 2.7 percent of California's annual hydropower production. The California Energy Commission concluded that the environmental mitigation associated with relicensing and selective decommissioning of projects has not impacted the ability of the State's electricity system to meet demand.<sup>7</sup> Importantly, this conclusion was based on the impact of implementing *all* environmental mitigation, not just salmon concerns. As a result, it is likely that the impact of implementing project modifications associated with the salmon is a subset of the impacts as determined by the Commission.

For the seventh threshold, a similar context can be given for salmon-related expenditures, including the monetary value of lost/replacement energy production. Whether or not flow regime changes are necessary for salmon/steelhead at a particular project, and the level and method of change required is determined on a case by case basis. Further, the economic impact associated with a flow regime change is dependent upon the type of project. For example, replacing power generated by peaking

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<sup>6</sup> An important exception is the case of the White River hydropower project in the Pacific Northwest discussed later in this appendix. The White River project had an installed capacity of 70 MW.

<sup>7</sup> California Energy Commission. California Hydropower System: Energy and Environment, Appendix D: 2003 Environmental Performance Report. August 2003.

projects (i.e., projects that produce hydropower during periods of highest demand) is more expensive than replacing base power production. Until a hydropower project operation is reviewed, the type and level of flow changes necessary and feasible for species and habitat protection is speculative. To provide context, Exhibit G-1 highlights examples of anticipated cost impacts associated with flow regime changes for the salmon and O. mykiss at various projects in the Northwest.

<b>Exhibit G-1</b> <b>ECONOMIC IMPACTS ASSOCIATED WITH FLOW REGIME CHANGES</b> <b>FOR THE SALMON/STEELHEAD</b>			
<b>Hydropower Project</b>	<b>Description of Cost</b>	<b>Cost of Changes to Flow Regime in (per year)</b>	<b>Source</b>
Rocky Reach Dam (Columbia River, Washington)	Market Value of Lost Power Generation	\$7,130,000	Survey of Chelan County Public Utility District February 2004
Rock Island Dam (Columbia River, Washington)	Market Value of Lost Power Generation	\$8,480,000	Survey of Chelan County Public Utility District February 2004
John Day Dam (Columbia River, Washington)	Cost of replacement power from lost power generation associated with dam drawdown	\$100,800,000	Huppert, Daniel D., Davil L. Fluharty, Eric E. Doyle, and Amjoun Benyounes. Economics of Snake River Salmon Recovery: A Report to National Marine Fisheries Service. October 1996.
Wanapum Dam (Columbia River, Washington)	Cost of loss generation due to increased summer spill	\$80,000,000	“Grant PUD Meets Survival Goals at Two Mid-Columbia Dams.” Columbia Basin Bulletin. September 26, 2003.

As evidenced, costs associated with flow regime changes may be high with respect to other types of expenditures (e.g., fish screens). Economic impacts of flow regime changes, however, vary by orders of magnitude dependent on the specific regime recommendation and hydropower project.

For both thresholds of this energy impact analysis, the total impacts of conservation measures may exceed the thresholds for determining that an adverse energy effect is significant. This accounting, however, significantly overestimates the incremental impacts of critical habitat designation, for there is strong evidence that the jeopardy standard alone is capable of imposing significant impacts. This evidence comes from NOAA Fisheries biological opinions that have imposed significant impacts on hydropower projects in the absence of critical habitat.

For example, in the Northwest NOAA Fisheries recently issued a draft revised biological opinion covering the operations of the FCRPS. Recent capital modifications and all operating modifications can be attributed to this biological opinion concerning only jeopardy, and not adverse modification, of nine ESUs as the source of the FCRPS impacts.

Because critical habitat was either not designated or not considered in past biological opinions that have resulted in significant salmon-related project modification, the impacts of section 7 implementation are attributable to the application of the jeopardy standard alone. This does not mean that critical habitat designation will have no incremental impact, but it does point to a necessary condition in order for those impacts to be significant. Enforcement of the adverse modification standard will have significant impacts only if it constrains Federal activities in "new" or "stronger" ways, so to speak. Given the obvious breadth of the application of the jeopardy standard to habitat-modifying Federal activities, it is not obvious what these "new" or "stronger" ways will be. Critical habitat designation can force Federal agencies to re-initiate consultations but it is not credible to expect significant incremental impacts above those already in place from the application of the jeopardy standard alone.

For these reasons, while the total impacts of section 7 implementation on energy production may be significant, the likelihood that the incremental impacts of critical habitat designation will also be significant is very low. For that reason, NOAA Fisheries believes that the designation of critical habitat will not have impacts that exceed the thresholds identified above.